CLAIMS

1. A method for preventing corrosion of metal surfaces of a semiconductor device during semiconductor processing, comprising:

exposing a surface of a metal layer of the semiconductor device;

depositing and selectively bonding a sacrificial protective layer overlying the exposed metal layer surface of the semiconductor device, wherein the sacrificial layer protects the exposed surface from deleterious effects until subsequent processing of the semiconductor device; and

subsequent processing of the semiconductor device, wherein the subsequent processing removes the sacrificial protective layer.

2. The method of claim 1, wherein the semiconductor device includes at least one of a portion of a semiconductor wafer and a semiconductor die.

3. The method of claim 1, wherein the metal layer includes a metal feature of the semiconductor device.

4. The method of claim 1, wherein the exposed surface by itself is subject to deleterious effects in response to at least one of a moisture containing ambient and an ambient conducive to causing corrosion.

5. The method of claim 1, wherein exposing the surface can include at least one of an etching process, a chemical mechanical polishing process, a metallization process, and a photo-imageable develop layer process.

6. The method of claim 1, wherein the deleterious effects include corrosion.

7. The method of claim 1, wherein the deleterious effects include at least one of degraded electrical performance of the semiconductor device, degraded semiconductor device reliability effects, and undesired electromigration effects.

8. The method of claim 1, wherein the depositing and selectively bonding includes using a vapor corrosion inhibitor to form the sacrificial layer on the exposed metal layer surface.

9. The method of claim 1, wherein the sacrificial layer includes at least one monolayer of a vapor corrosion inhibitor.

10. The method of claim 9, further wherein subsequent processing removes the at least one monolayer of the vapor corrosion inhibitor.

11. The method of claim 1, wherein the subsequent processing includes forming another exposed metal layer, said method further comprising:

exposing a surface of the another metal layer of the semiconductor device;

depositing and selectively bonding another sacrificial protective layer overlying the another exposed metal layer surface of the semiconductor device, wherein the another sacrificial layer protects the another exposed surface from deleterious effects until subsequent processing of the semiconductor device; and

subsequent processing of the semiconductor device, wherein the subsequent processing removes the another sacrificial protective layer.

12. The method of claim 1, further wherein the subsequent processing includes a deposition of another layer over the semiconductor device.

13. A method for preventing corrosion of metal surfaces of a semiconductor device during semiconductor processing, comprising:

exposing a surface of a metal layer of the semiconductor device;

depositing and selectively bonding a sacrificial protective layer overlying the exposed metal layer surface of the semiconductor device, wherein the sacrificial layer protects the exposed surface from deleterious effects until subsequent processing of the semiconductor device; and

subsequent processing of the semiconductor device, wherein the subsequent processing includes removing the sacrificial protective layer, re-exposing the metal layer and depositing another layer over the semiconductor device and the re-exposed metal layer.

14. The method of claim 13, wherein the semiconductor device includes at least one of a portion of a semiconductor wafer and a semiconductor die.

15. The method of claim 13, wherein the metal layer includes a metal feature of the semiconductor device.

16. The method of claim 13, wherein the exposed surface by itself is subject to deleterious effects in response to at least one of a moisture containing ambient and an ambient conducive to causing corrosion.

17. The method of claim 13, wherein exposing the surface can include at least one of an etching process, a chemical mechanical polishing process, a metallization process, and a photo-imageable develop layer process.

18. The method of claim 13, wherein the deleterious effects include corrosion.

19. The method of claim 13, wherein the deleterious effects include at least one of degraded electrical performance of the semiconductor device, degraded semiconductor device reliability effects, and undesired electromigration effects.

20. The method of claim 13, wherein the depositing and selectively bonding includes using a vapor corrosion inhibitor to form the sacrificial layer on the exposed metal layer surface.

21. A semiconductor processing apparatus for preventing corrosion of metal surfaces of a semiconductor device between semiconductor processing steps, said apparatus comprising:

means for exposing a surface of a metal layer of the semiconductor device; and

means for depositing and selectively bonding a sacrificial protective layer overlying the exposed metal layer surface of the semiconductor device, wherein the sacrificial layer protects the exposed surface from deleterious effects until subsequent processing of the semiconductor device.

22. The apparatus of claim 21, wherein said exposing means includes at least one of a means for performing an etching process, a chemical mechanical polishing process, a metallization process, and a photo-imageable develop layer process.

23. The apparatus of claim 21, wherein said apparatus further comprising:

means for subsequent processing of the semiconductor device, wherein the subsequent processing removes the sacrificial protective layer.

24. An apparatus for implementing corrosion prevention of exposed metal surfaces of a semiconductor device between independent semiconductor processing steps, said apparatus comprising:

an enclosure for receiving the semiconductor device; and

means for depositing and selectively bonding a sacrificial protective layer overlying the exposed metal layer surface of the semiconductor

device, wherein the sacrificial layer protects the exposed surface from deleterious effects until subsequent processing of the semiconductor device.

25. The apparatus of claim 24, wherein the depositing and selectively bonding means includes a vapor corrosion inhibitor that forms the sacrificial layer on the exposed metal layer surface.

26. The apparatus of claim 24, further comprising one of an internal vapor corrosion emitter, intregal vapor corrosion emitter, and an external vapor corrosion emitter, wherein the emitter provides a source of the vapor corrosion inhibitor.

27. The apparatus of claim 24, wherein the sacrificial layer includes at least one monolayer of a vapor corrosion inhibitor.

28. The apparatus of claim 24, wherein subsequent processing includes a removal of the at least one monolayer of the vapor corrosion inhibitor deposited on the surface.

29. The apparatus of claim 24, wherein the deleterious effects include corrosion.

30. The apparatus of claim 24, wherein the deleterious effects include at least one of degraded electrical performance of the semiconductor device, degraded semiconductor device reliability effects, and undesired electromigration effects.